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CRITTALL

SOLID STEEL

REVERSIBLE WINDOWS



FOR OFFICE BUILDINGS
SCHOOLS HOSPITALS AND OTHER
SUBSTANTIAL BUILDINGS

CRITTALL CASEMENT WINDOW COMPANY
DETROIT



Crittall Casement Window Company

Representatives

ALABAMA
BIRMINGHAM - Beecroft & Mallory
420 North 21st St.

ARKANSAS
LITTLE ROCK - Clippard Builders' Supply Co.
123 N. Louisiana St.

CALIFORNIA
LOS ANGELES - J. E. Dwan
616 S. Utah St.
SAN FRANCISCO - Waterhouse-Wilcox Co.
523 Market St.

COLORADO
DENVER - William H. Clark
Inter State Trust Bldg.

CONNECTICUT
NEW HAVEN - A. R. Kirschner Co.
153 Court St.

DISTRICT OF COLUMBIA
WASHINGTON - Lally-Rohlader Co., Inc.
292 Woodward Bldg.

FLORIDA
JACKSONVILLE - Henry H. Hull
208 Hill Building
MIAMI - I. E. Schilling Co.
229 Sixth St.

GEORGIA
TAMPA - Booker & Co., Inc.
Morgan and Bell Sts.
ATLANTA - Crittall Casement Window Company
1520 Healey Building

ILLINOIS
SAVANNAH - J. E. Wood Co.
CHICAGO - Crittall Casement Window Company
105 W. Monroe St.

INDIANA
PEORIA - C. J. Jobst & Co.
EVANSVILLE - Evansville Structural Supply Co.
Old State Bank Building

IOWA
FORT WAYNE - Hugh J. Baker & Co.
704 First National Bank Building
INDIANAPOLIS - Hugh J. Baker & Co.
602 W. McCarty St.

KANSAS
DAVENPORT - Mueller Lumber Co.
DES MOINES - Hawkeye Engineering Co.
821 Hubbell Building

LOUISIANA
SIOUX CITY - Haakinson & Beatty
NEW ORLEANS - J. T. Mann & Co.
936 Union St.

MARYLAND
BALTIMORE - Kemp & Jackson
15 E. Fayette St.

MASSACHUSETTS
BOSTON - Skillman & Sunderland
1042 Little Building

MINNESOTA
DULUTH - H. D. Bullard
302 Builders' Exchange
MINNEAPOLIS - George Hauenstein
654 Builders' Exchange

MISSOURI
ST. PAUL - O. W. Burmeister
505 Pioneer Building
KANSAS CITY - Crittall Casement Window Company
301 Orear-Leslie Building

NEBRASKA
ST. LOUIS - Randolph Sales Co.
1126 Chemical Building

NEBRASKA
OMAHA - Twin City Brick Co.

NEW MEXICO
ALBUQUERQUE - P. O. Sorenson

NEW YORK
ALBANY - George S. Woodward
50 Beaver St.
NEW YORK - Crittall Casement Window Company
101 Park Avenue

OHIO
UTICA - American Hard Wall Plaster Co.
CINCINNATI - Crittall Casement Window Company
209 Gerke Building

OKLAHOMA
CLEVELAND - Crittall Casement Window Company
Builders' Exchange
OKLAHOMA CITY - E. G. Remmers
904 State National Bank Building

OREGON
PORTLAND - McCracken-Ripley Co.
45 Fourth St.

PENNSYLVANIA
PHILADELPHIA - L. F. Nichols Co.
Real Estate Trust Co. Building
PITTSBURGH - Hubert Moore
245 Fourth Ave.

READING
READING - Daniel F. Yost
312 Baer Building
SCRANTON - Lackawanna Builders' Supply Co.
Real Estate Exchange

TENNESSEE
KNOXVILLE - The W. B. Martin Co.
825 Holston Bank Building
MEMPHIS - Tri-State Iron Works
Builders' Exchange

TEXAS
NASHVILLE - E. T. Kirkpatrick & Co.
67 Arcade
EL PASO - Neff-Stiles Co.
FORT WORTH - Collinsville Manufacturing Co.
1009 E. Front St.

UTAH
HOUSTON - R. B. Everett & Co.
3112 Harrisburg Blvd.
SAN ANTONIO - George E. Ginter
506 Calcasieu Building

VIRGINIA
SALT LAKE CITY - Williams & Derrah
407 Dooly Building
LYNCHBURG - A. P. Montague
302 Peoples Bank Building

WASHINGTON
NORFOLK - L. W. Tazewell & Co.
Brokers' Exchange Building
RICHMOND - Virginia Equipment & Supply Co.
418 East Main St.

WEST VIRGINIA
SEATTLE - F. T. Crowe & Co.
508 Westlake Ave. No.
SPOKANE - R. H. Hoskins
510 Hyde Block

WISCONSIN
TACOMA - F. T. Crowe & Co.
1177 Dock St.
HUNTINGTON - J. J. Weiler & Sons
MILWAUKEE - A. F. Wagner Architectural Iron Works
763 North Water Street

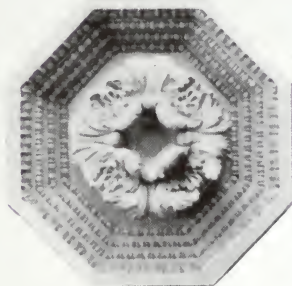
CRITTALL

SOLID STEEL

REVERSIBLE WINDOWS

Patents No. 1,382,578 and 1,464,229

Other patents pending



Catalog No. 1-24

CRITTALL CASEMENT WINDOW COMPANY
MANUFACTURERS

Main Office and Works: DETROIT, MICHIGAN

New York Office: 101 PARK AVENUE

Cincinnati Office: 209 GERKE BUILDING

Chicago Office: 105 W. MONROE STREET

Atlanta Office: 1520 HEALEY BUILDING

Kansas City Office: 301 OREAR-LESLIE BUILDING

Cleveland Office: BUILDERS' EXCHANGE

Agents in all principal cities



Reversible Windows

SELECTION of windows for office buildings, hospitals, schools and similar structures is constantly looming larger among the problems facing architects, engineers, and owners of buildings. A study of some of the fundamental requirements which a window should fulfil may tend to simplify the work involved in choosing.

These requirements may well be listed:

1. *Maximum light.*
2. *Maximum ventilation.*
3. *Ease of operation.*
4. *Ease of cleaning.*
5. *Durability.*

To these qualities others may be added such as weather-tightness, which is so decidedly essential that it may almost be taken for granted; fire resistance, indispensable to any truly fireproof building; low upkeep cost; resistance to weather changes, and the like.

Against these essentials Crittall Reversible Windows may be checked, and they will be found satisfactory in every detail. Thus the narrow steel members of the Crittall Reversible Window give the maximum light possible for any masonry opening. In addition, the shades may be so arranged that they follow the sash when it is open, thus giving an awning effect without the fire danger or the expensive upkeep of awnings. This results in a most agreeable working light.

Again, Crittall Reversible Windows permit of controlled ventilation. The opening may be varied from the slightest crack to the entire window space (100 per cent).

The sash do not rattle no matter how widely they are opened, and they stay rigidly in posi-

tion without the use of stays, weights or adjusters. Either leaf operates independently of the other, so that the upper one may provide ventilation while the lower one is shut to prevent drafts.

The friction device that holds the sash open operates in brass channels, insuring against corrosion. Thus smooth, easy operation is permanently certain.

The exterior may be cleaned from the interior by simply reversing the sash. No thumb screws or catches need be released. The opening motion of the sash is merely continued until the sash are sufficiently reversed for cleaning.

Built of solid rolled steel sections, these windows are made for permanence. The material is Crittallooy—the copper bearing steel—the life of which is from 200 to 300 per cent longer than most commercial steels and irons. The working parts are all simple and strong and are constructed to last throughout the life of the sash without attention. The hardware is of solid bronze.

They are, of course, weather-tight, and are so guaranteed by the Crittall Casement Window Company.

They are fireproof and for special locations can be supplied bearing the label of the Board of Fire Underwriters.

The cost of upkeep is extremely low, as an occasional coat of paint is all that is required. Obviously the sash cannot cause annoyance by warping, swelling or shrinking, as steel is not affected by climatic changes.

From every angle, Crittall Reversible Windows are unsurpassed as sash for office buildings, schools, hospitals and other substantial structures.



JEFFERSON STANDARD BUILDING, GREENSBORO, N. C.

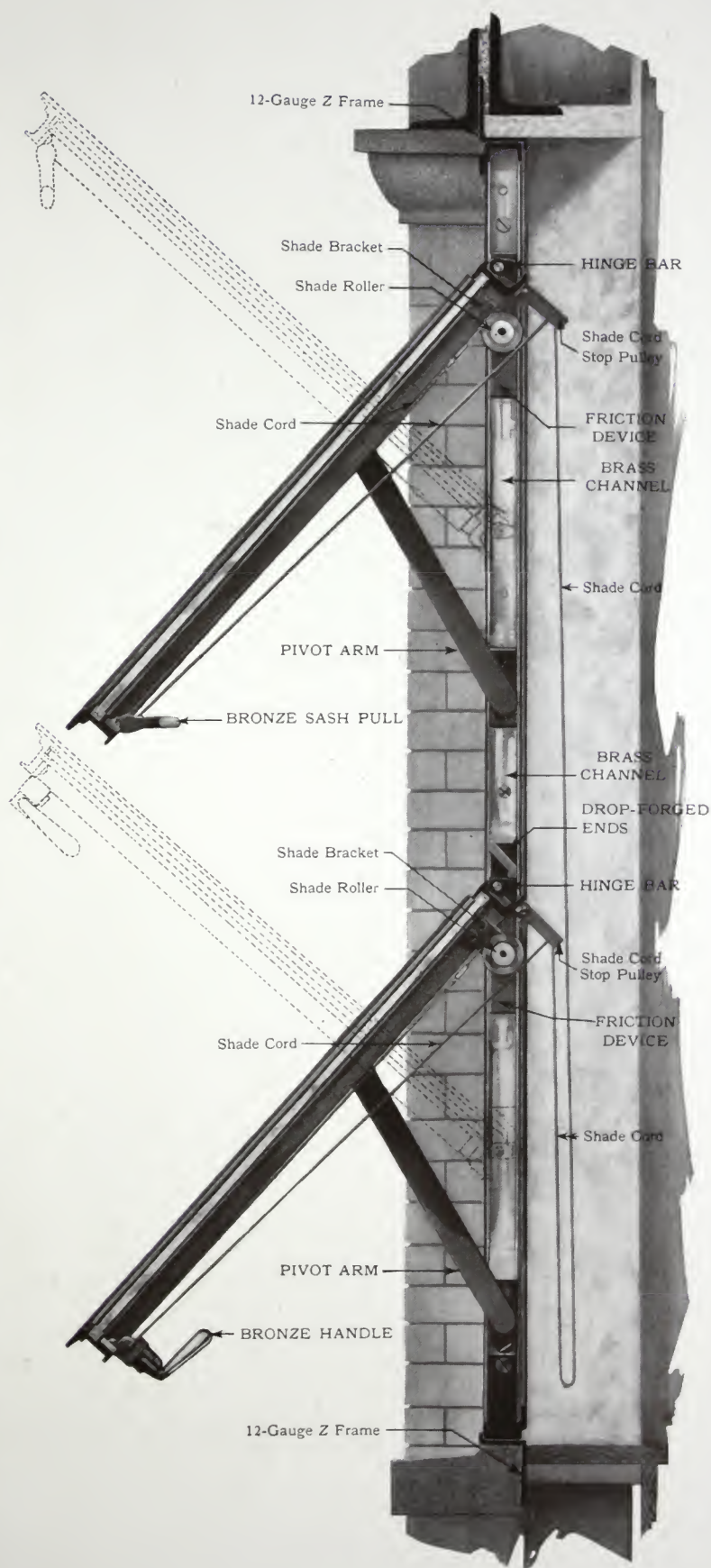
CHARLES C. HARTMANN, *Architect*

THIS sectional view of a Reversible Window shows the rugged construction, the simplicity of operation, and the perfection of detail of this sash.

Each sash is hung to a solid steel bar (called the "hinge bar") by means of substantial bronze butts on hardened steel pins. The bar itself ends in machined drop forgings to which are attached the friction devices. The bar maintains its position at all times, simply sliding up and down in the brass lined channels at the jambs.

The lever arms on which the sash pivot are of cold rolled steel 1 inch wide by $\frac{1}{4}$ inch thick, to insure sufficient strength. Strength is needed here as the slightest bending of this arm would cause it to bind, preventing easy operation.

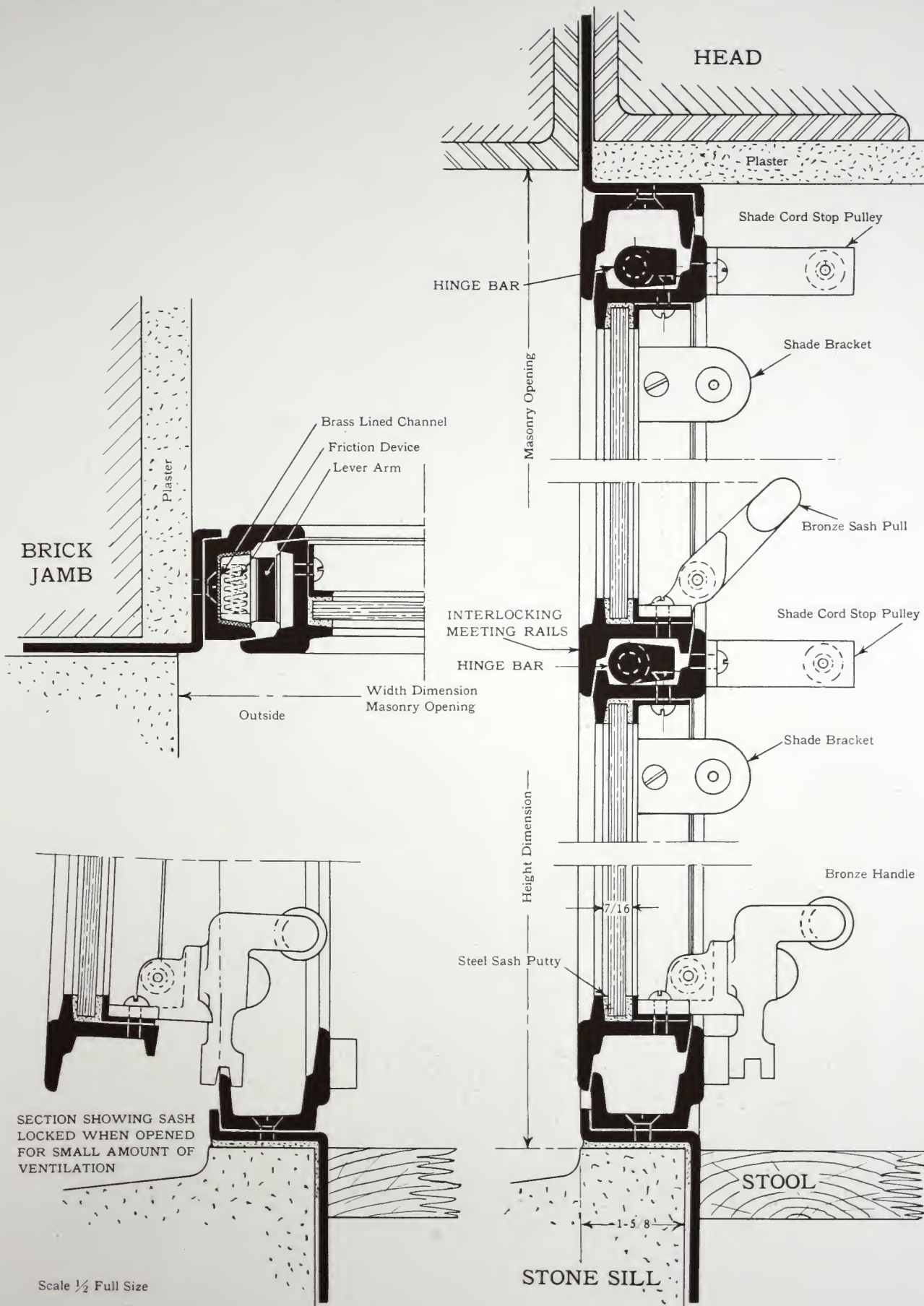
The cam on the upper part of the end of the hinge bar draws the upper leaf closed and locks it automatically with the closing of the lower leaf. This permits the use of simple hardware for pole operation of the upper leaf, doing away with any special devices which might easily get out of order. All hardware is substantially made, and is of solid bronze.





CAPITOL BUILDING & LOAN BUILDING, TOPEKA, KANSAS

GEORGE G. ELMSLIE, *Architect*





GEORGE G. ELSLIE, *Architect*

JOSEPH, GEORGE AND NEWHALL OFFICE BUILDING, AURORA, ILLINOIS

CONCRETE LINTEL

CONCRETE LINTEL

The Hinge Bar, on which the sash are hung by bronze butts with hardened steel pins, slides up and down in the brass lined channels detailed below. To the ends of the bar are attached the friction devices, working in the brass channels, which hold the sash open in any desired position.

HINGE BAR

Shade Cord Stop Pulley

Shade Bracket

Brass Lined Channel
Friction Device
Lever Arm

BRICK JAMB

BRICK

Width Dimension
Masonry Opening

INTERLOCKING
MEETING RAILS

HINGE BAR

Shade Cord Stop Pulley

Bronze Sash Pull

Shade Bracket

Height - Dimension -

Bronze Handle

Steel Sash Putty

MULLION

Outside

STOOL

STONE SILL

Scale $\frac{1}{2}$ Full Size



WOMEN'S INFIRMARY, KOCH HOSPITAL, ST. LOUIS, MISSOURI

EDW. E. CHRISTOPHER, *Architect*

THE two illustrations above show an installation in a hospital for tubercular patients. Here maximum ventilation and light are essential. It is obvious at a glance that this installation fills both these requirements to the fullest extent.

So much sunlight was desired that no shades were used in this installation. The upper leaves of the sash are glazed with frosted glass to prevent glare, yet to secure the full healing effects of the sunlight. The spacious corridors help to create a cheerful environment.

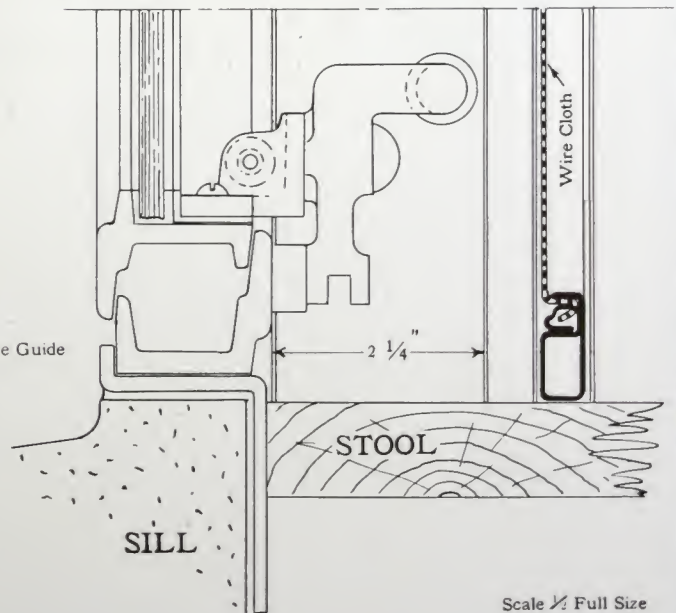
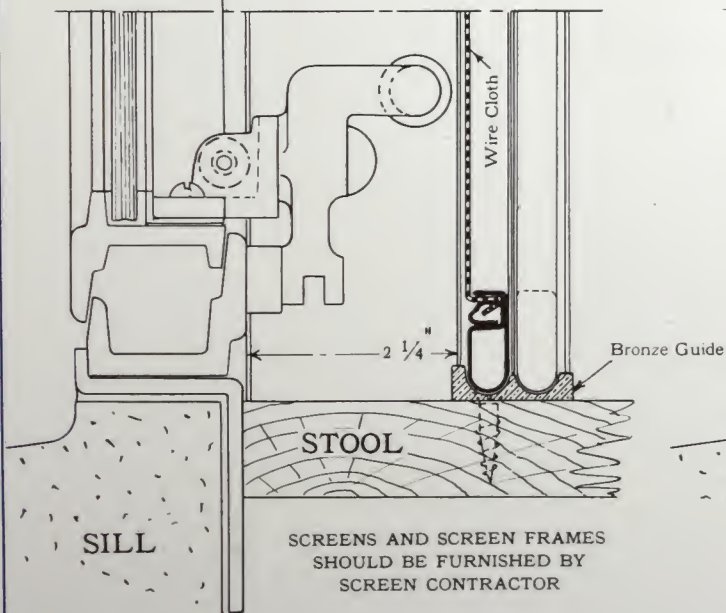
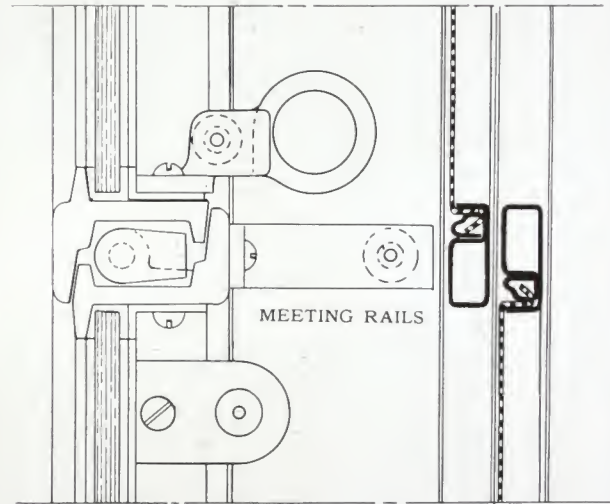
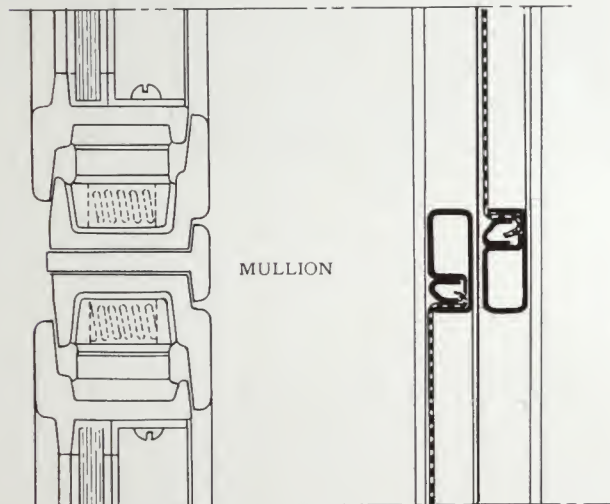
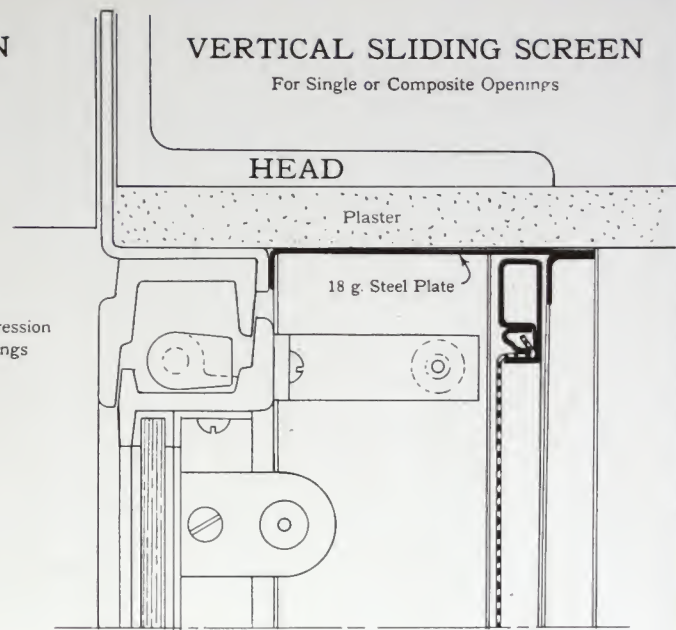
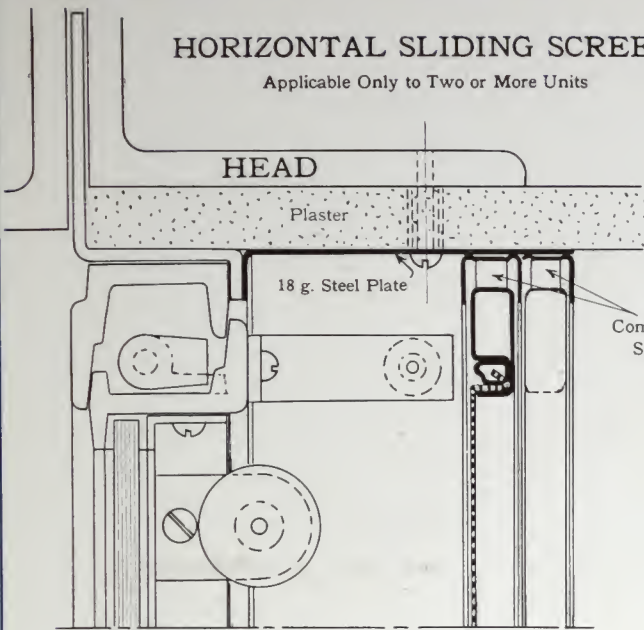
Both architects and physicians will readily see how adaptable are these sash to a hospital of any other type.

HORIZONTAL SLIDING SCREEN

Applicable Only to Two or More Units

VERTICAL SLIDING SCREEN

For Single or Composite Openings

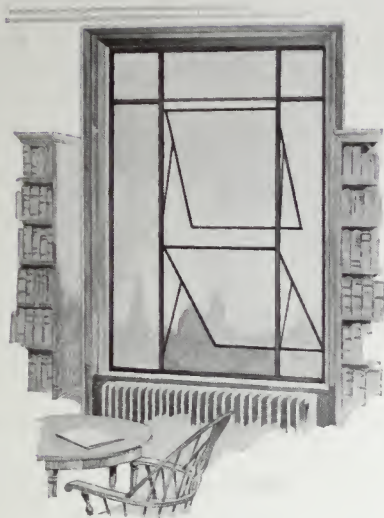


Scale 1/2 Full Size



A TYPICAL SCHOOL INSTALLATION

FIRE resisting—easily operated—giving maximum light, well shaded—at low cost of upkeep—Crittall Reversible Windows are ideal for schools, universities and libraries.



Combinations *and* Variations

CRITTALL Reversible Windows may be combined with Crittall Casements (Catalog 22) to form many pleasing designs, or to solve otherwise difficult window problems. Full use of our force of sales engineers may be made when any combination is thought advisable.

The standard Z sub-frame shown throughout this catalog will be found to be admirably suited for most uses. It is entirely possible, however, to set Reversible Windows into properly rabbetted sub-frames of cast iron or hollow metal, or even directly into stone or wood.

For economical and satisfactory solutions of problems arising out of any departure from the standard details illustrated in this catalog our engineers are placed at the service of architects.



Interior view showing both sash opened and reversed so the exterior can be easily cleaned from the inside.



The hooks and eye bolts are standard equipment and are furnished to prevent any accidental movement of the sash, thus effectually guarding the window cleaner.

OFFICE BUILDING REVERSIBLE WINDOW

Cleaning

IN buildings more than one or two floors in height provision for easy and safe cleaning of the windows is necessary. Cleaning the windows entirely from the inside, as is possible with the Crittall Reversible Window, means that no safety bolts for window cleaners need be supplied, and that the sill of the window may be made as narrow as desired to suit structural conditions, or for the sake of economy, without sacrificing the safety of the window cleaners.

The Crittall Reversible Window is designed to reverse by simply continuing the motion of opening the sash. No removal of latches, bolts or thumb screws is necessary. Steel bars, ending in hooks, are supplied to be attached to the sash, when reversed, to hold the sash firmly in position.

Specifications

Crittall Solid Steel Reversible Windows

General

THE printed general conditions and notice to bidders preceding the specifications must be referred to, and will control all portions of the work.

Work Included

ALL windows (state the elevations and exceptions) shall be reversible type, of solid steel, as manufactured by the Crittall Casement Window Company, Detroit, Michigan.

All windows shall be divided into the number of units shown on the drawings, and the sizes called for must be adhered to in all cases, as the structural work will not be altered to suit other conditions.

Ventilation

DIAGONAL lines on the elevations designate such parts as open, and those parts not so marked shall be fixed or stationary sash.

Material and Workmanship

ALL steel used in the manufacture of these sash shall be Crittallloy—the copper bearing steel—containing not less than 0.15% nor more than 0.30% copper in order to resist rust. It shall be free from hammer marks and other imperfections.

All sash shall have two points of contact, steel to steel, on all sides without the use of screwed on or pressed on fillets or strips. The intent is that the sash shall be solid, and no built up sections (either in the ventilating or stationary sash) or pressed parts will

be allowed. The corners of all sash shall be welded solid, and ground smooth before painting.

Each ventilating sash shall be hinged at the top by solid bronze butts with hardened steel pins to a sliding bar, the ends of which shall slide in brass channels set into the outside frame, and the sash shall be further supported by a fixed arm on each side which, when the ventilator is closed, shall be completely concealed within the sections. The sliding bar shall be equipped with friction devices of sufficient strength to hold the sash open in any desired position without the use of an adjuster or stay bar. The construction shall be such that the ventilators can be reversed for washing the windows from the inside. The sections shall be so arranged that the ventilators interlock when closed without employing a fixed horizontal bar or other device for locking the window at the meeting stile.

Hardware

THE hardware shall be of solid bronze finished a dark coinage color secured without the use of chemicals or plating. It shall consist of a grip at the bottom of the top ventilator for pole operation and a special lever handle at the sill to draw the sash closed. This lever handle shall be notched so that it will engage the outer channel to permit of a small amount of ventilation at the sill without allowing the sash to rattle. Shade brackets and shade pulleys shall be attached to each ventilator as standard equipment.

(Continued on page 18)

Paint

ALL steel sections shall be thoroughly cleaned of all rust and scale previous to painting, and shall receive one coat of rust resisting paint, red in color, before assembling; after assembling they shall be given one priming coat of dark blue paint before shipment from the factory. Finish painting shall be applied after erection by the painting contractor.

Glazing

GLASS will be furnished and set by others. The window manufacturer shall furnish steel angle glazing stops, for

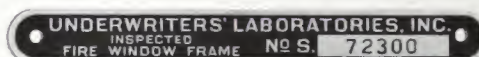
holding in the glass. The steel glass stops shall be attached at the factory by means of brass screws to permit of glazing from the inside.

Work Not Included

GLASS, glazing, finish painting, fly screens, window shades, cords, and poles shall be furnished by others.

NOTE: Specifications for window shades should include the following:

Window shades shall be equipped with continuous cords.



Specifications Crittall Reversible Underwriters' Windows

Specifications

ALL sash on (give locations and elevations) shall be Crittall Reversible Windows with label as furnished by the National Board of Fire Underwriters.

Sash shall be divided by muntins so that no pane of glass exceeds 720 square inches in area (sight size) and no one dimension (either width or height) shall exceed 54 inches.

Steel angle glazing stops shall be furnished in accordance with Underwriters' requirements.

Glass

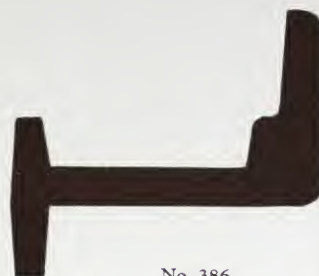
GLASS shall be furnished by others.

Glass for Underwriters windows must be at least $\frac{1}{4}$ -inch thick wire glass with mesh not to exceed $\frac{7}{8}$ -inch and the glass used must have at least $\frac{1}{16}$ -inch clearance all around and be bedded on both sides with putty.

FULL SIZE REVERSIBLE WINDOW SECTIONS



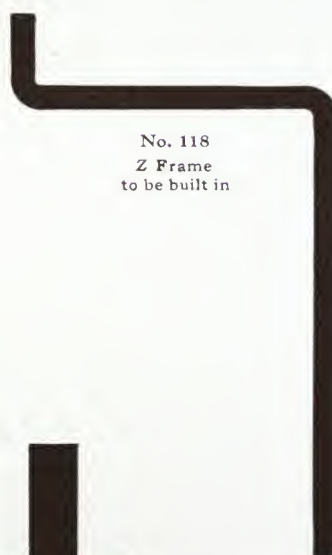
No. 385
Sides and Bottom
of Swinging Sash



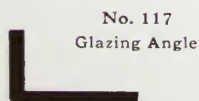
No. 386
Top of
Swinging Sash



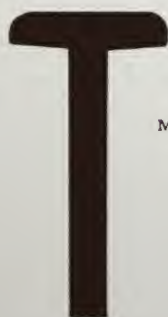
No. 391
Sides, Top and Bottom
of Fixed Frame



No. 118
Z Frame
to be built in



No. 117
Glazing Angle



No. 103
Mullion Bar



No. 119
Mullion Bar
for
windows of excessive
height or width



